

**Engineering electrical career job workplace office place engineering outcome ,trade
engineering outcom,education tech ingenieure work partnership visited meeting
engineering, inovation college job functions,to government industrial experience function
job.and gradient function job**

industrial engineering electrical and social development.

**By : TSHINGOMBEKB, tahitaditshingombe, me,
tshingimbeKb**

**Seminaire session day confereence meeting café topic day
Presente : study governance career**

Cvs title: gouvernement and education job engineering college
Job duty:
Section 2

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 Achievements/Tasks
 award degree diploma saqa/ award panel wiring electrical
 Contact

1.content: engineering electrical career project officer outcome legislation government engineering gov.city municipality engineering theory and practical experience engineering

1.1.scope of work workplace engineering career

2.summarise: assessment officer outcomes education technology engineering : government .minister deputy government . framework mandatory compulsory student order.in order to determine research college order to work.and regulate
 - **home affairs department** ;,general requireded work visa for temporary se jour time .v.fs.appinrment letter completed valid ,pass port ndp critical saqa ,webmaster ..

Education department dheth basic..permit student .

Council education council trade . engineering council

Department labour and public work

Development.skill...justice development

Power attorney.dol

I fracture social development

Department defense .police safety security

Sandf.saps psira seta permit bargaining sector competency fire arm gun operational

-dti department trade industries.sector non proliferation the department of trade industry ,of weapons mass destruction council ,regulate strategic, protection interest , government control , implementation student workshop place visited ...

-Dmr.departement mineral energy..electricity sale revenue and prices power plant ,fuel use ,stocks,electricity independ ,national treasure economic sars department of energy mandate responsible ensuring private sector participation in pour generation through competition bidding process come regularity primary source development electricity sector

-department of science and innovation ,socio economic development goal,resource scie bono center career.

Programme administration technology innovation cooperation.

- programme research development support.

Purpose knowledge...strategies,objective, developed humain generation components

Basic science infrastucture implementation of research inovation equivalente,science .mission . astronomy.

R tax incentives ama.

Department economies sars economies empires ..

- national energy regulator of South Africa authority mandate ista regulate the electricity piped gaz and petrol ,consolid jurisdiction Coe chief officer legislation , invitation to comment amendment 3800 mW ministerial determination invitation comment net billing rules **development , tribunal**.info@nersa organ.

- electrical conformance board ECB, South Africa ,designer ,installer and the regulator custome ,

- for profit find reseller cocs ,outlet online keeping for your client ,tech competence implementation dissemination stand ,address,standard,,,

Department economies:

How much is the total power supply consumption of ATM click 24;,,5,52kw,,

Unite rptibke power auplie in banking and finance sector power challange ATM ,cost consume ATM 1,3kw auxiliare automatic teller machine ATM custome size

2.2. Abstract job work: function job work ,function gradient function function

3.entry engineering electrical trade infrastructure implementation support

Qualifications career category job skills:

4.purpose assessor criteria recruitment job ask career education and training engineering office case study.

4.1 case study how to make calculation for a distribution substation

1010,4kv,2x1600KVA,mean introduction substation with an installed power of 2x1600 KVA are a typical,electrical power supply facilities which can value of all relevant physical quantities shall be major equipment inside

.-basic guide for calculation dimensionning will be adequate IEC standard and practical engineering experience,of course be side electrical there civil hand HVAC heating ventilation and air condition air.

-requirement. Substation which need,

Continuous current calculation and dimensioning.

-short circuit calculation and dimensioning.

- summary of selected equipment.

- substation :when say 2x1600kva that mean two power transformer each of theme with rated of 1600kva will be installed inside substation.

-strictly speaking but not necessarily 2x1600KVA designation assume on substation.capability coverage peak power demand of 2x1600=3200Kva that further implied

parallel operation of transformer .I both transformer on the other hand want will be a working unity other serve as a spare designation (1600+1600)KVA ,

-the latter mean that substation

-this example, will be based on 3200KVA peak demand requirements, beside that other major input data necessary for for calculation and designated

- medium voltage rated value.

low voltage rated value,short circuit power short circuit current, number supply cables,

-typical of earthing arrangements, maximum ambulant temperature single line diagram of distribution.

- substation is give supplies from 10kv distribution network via two cable typical solutions for so called typically of supply

Medium voltage switchgears design tag supplies power transformer design tag T1and T2 with voltage transformation ratio of 1010,4 kV power is further distributer to consumer on 0,4KV voltage level busbar system

-power substation design system and calculation study engineering

System planning short circuit studies load flow studies insulation coordinator study

-electrical protection and and control analysis DC system battery calculation.

-ac system auxiliary power transmission.

Ground grid study lightning protection calculation.

-light nint calculation voltage drops calculation conduit dill calculation civil structural substation design,

-land survey and site grading analysis,

-geotechnical investigation and foundation calculation structural ,

Miscellaneous substation designation noise calculation .

-designation calculation transformee noise calculation harmonic analyse,fire protection,

-Ask fact answe how content fault generators to grid loads flow conductor increased power, determine trip mva transmission correct power factor.

Outcome of auxiliary tfo ground gride studies drive general arrangements plan drawing elevation section light.

-light calculation ,voltage drop 125 volt 90,PVC conduit

-outcome of conduits fill calcule wire pulled installed a combination Mont cable,

-land outcome survey determine feasibility creation storage result incorporated sit grading plan drawing,site grading ,

Power harmonic filter non linear , Draw power.

5.purpose and requireded: engineering problem mathematics engineering

-Calculation of electric field on substation equipment considering AC ion flow field ,increase of voltage in substation discharge surface high voltage conductor substation be coming influence,order stady AC substation criterion emittion calculate estimate 750kv conductor to ground distance 24,5

Conductor to 25,5 m phenomenon,

- Calculation emotion charge alternation cycle discreet time step time step instant balanced applied voltage.

$V_a = V_{max} \cdot \sin(w(i-1)\Delta t..$

$V_b = V_{max} \cdot \sin(w(i-1)\Delta t$

$V_c = v_{max} \cdot \sin(w(i-1)\Delta t.$

$I = 1,2,3$ NT zero value value

$V_a = 0$ $V_B = 0,5$ $V_C = +0,5$

the first time step ($I=1$),. V_{max} ,.. v_{min}

Schema diagram line AC applied .

$E_{onset} = n \times (33,7 + 8.13/\sqrt{r}).kV/cm$

$E_{onset} = n(31,10 \times 9,55/\sqrt{r})kV/cm$

-electrical field gth match point conductor.

$E_g = 3M \sum Q \sin 2\pi f o [1/R_{ai} + 1/R_{ai.e.si}]$

Q on set a,sum m I qci,

Q onset b,sum 2m qci

Q onset c ,sum 3 m ,I 2m qci

6.required: 750 KVA Conductor,19,5;Min not , ca

- cable designing program,

Activity day	Care log	Close tende

- calculation home electric load electrical bi.
- calculate electrical busbar size and size and drop ,
- Calculate insulator resistance value,
- calculation numbers of lightings fitting and lumen output
- Calculation size of solar panels battery bank and inverter.
- circuit breaker tripping., conduit size selection program
- designation of earthing rate,
- Selection of mccb,elcb for main branch circuit
- selection of fuse and setting of instant short circuit tripping cb
- Sharter circuit current calculation various point.
- size of capacitor for power factor improvement faulty current calculator.
- electrical safety program arc flash Calculation.
- E feeder and cable calculator
- Squared selected capacitor size voltage drops calculation , voltage regulators distribution,
- Resident load calculation.transformation .
- power line voltage faulty power line voltage drop calculation.
- electrical safety program arc Flash calculator ,power factor correction touche voltage ground
- electric engineering Calculation engineering, calcule size circuit breakers for calcautionloft,
- Lighting pnot assessment regut load lush calcaution ,diesel electromagnetic.

6.requirement : power station and central system

- generator KVA , measure 20kva ,3 phase generator has trues of $16(20 \times 0,8)=16$
- Rating are available so KVA range of power our site 6kva,up500kva,20kva t 100kva
- generator full load Curt calculator calcule the full load current of a single 3phase generator voltage 120v,3ph AC generator 2kw ,pf0,8 cos
- Generator faulty current calcuatir ,
- cable size calculator as ,
- Parameter: ,rated voltage VP the rated voltage of the generator in volt v,
- Phase specific the phase arrange in phase AC or 3 phase AC generator rating, specific the generator rating kW or KVA,cos
- full load current 3 phase generator specific kW.
- $I = 1000 \times S_{kw} / \sqrt{3} \times V_{LL} \times \cos \pi$.
- S.kw is the generator in kilo watt (kW)
- VLL is the generator line to line rated voltage in .
- Calculate the full load current of a 50kw,480v,3 phase generator the estimated load power factor, 0,85
- $I = 1000.50 / \sqrt{3} \times 480 \times 0,85 = 70,8A$
- full load current for 3 phase generator specified in KVA is calculated as .
- $I = 1000 \times S_{kva} / \sqrt{3} \times V_{LL}$.
- sva is the generator rating kilivolt amp (KVA).
- Is generator line .to line rated voltage in calculate the full load current of 50kva,480v,3phase
- $I = 1000.50 / \sqrt{3} \times 480 = 60,1A$.
- $-I = 1000. S_{kw} / V_{LN} \times \cos \pi$..
- Vln is the generator line .to .neural rated voltage in volt cos(π).
- 2kw,120v, phase generator,0,85,,
- $I = 1000. skva / v_{ln}.$
- $I = 1000 \times 50 / 480 = 16,7A$,
- 3000 watt ,3kw sign 120 ,of =0,8 ,, $I = 3000 / 120 \times 0,8 \times 31,2$
- $I = 10000 / \sqrt{3} \times 120 \times 0,8 = 60,1A$,,,3 phase ,240 generator, $I = 10000 / \sqrt{3} \times 240 \times 0,8 = 30$
- 7500w generator,of,
- Load, $I = 7500 / (120 \times 0,8) = 78,1A$,
- multiplication factor for stand by load=100%. Of continuous load+50% of intermittent load,max peak operating load=100% of continued load +59,% of intermittent load + 10% of stand by normal operation.load with growth.
-

Requireded:

- appliance tv reliable,running** 200w,15,; starting ,
- 2300+1200+100 rated outputs.
- load listing calculation and generator sizing ration between absorbed power and rated
- motor between 0-kw-15kw. Load

-15kw-45kw,,45kw-150kw .

Efficiency % output inputs , kW consumed by motor absorbe x efficiency x power

Kvar consumer by motor = $kW^2 + KVA$

Multiplication factor for continued load =50%

Factor=110% of max normal operating load peak operating , growth factor °110% Of max peak generator size in 70 load factor peak load factor peak load factor peak operating load with operating load with growth factor

Version Francaise

8.Requirements:

Poste de travaille bureau d etude:

Accueil depanage et installation Electrique Sur renovation our neouf ,mise conformity de tableaux electrique,

_ pour la protection de personnel mise en place d UN Nombre adequate d interrupter differential 30 mA contre incs die mise en place disjoncteur remise aux norm de securite ,eliminer Les risque d incendie et ou ekecteisation des personnel lies usage d une installation Electrique defectuese ,

- verification installation si besoin

-elimination des prise et interrupter defectueux des cable Mal isole , intervention Sur haute et base tension ,recherche de pannes, installation en Voix dinners,

8.1 electricite biocompatible, information,measure electromagetic,mourn product

-meaure et analyse des champs electromegnetic,

Effect Sur la Sante CEM Liew exploision .

-prevention et curating issue anormalie spectre.

-CEM base frequency ligne HT et distribution 230v ,HT distribution appareillage domestic hyperfrequence pulse telephone Relais, telephone,detect WiFi,Bluetooth,

-lorsqu on procedeba la mesure de champs electrique et magnetiaue priorite frequement au cours ,

- Les mesures la mesure de la resistance de votre terre,

La mesure de champs electrique et magnitude.

- la mesure des champs magnetic Haut frequency realisation d une cartography de la pollution electromagnetic a votre habitations une etude completed realisat par rapport information Sur Les risque norme et seuil sensibilite , proposition de solution aux problems consent

8.1 required :

-dimensionnement et cablage de cable ,cequi relief Tous Les xomposant d UN system electrique Ce sont le cablage fournissent l energies source d'alimentation la distribution aux appareils aux Lumiere

-type de circuit : chute tensions a 10%non critique 0,6m,,51-61,,

-chutw tension a 3% critique 5A-200a, 0-2m ,

Calibre: maniere courant AwG American wire gauge method standard pour desigule diameter des file EST mesurant le diameter du conducteur measure uniquement course file,sans isolant ----calibre file .Europ,norm AwG 00,000,00,

Diameter mm 11,68,. 10,40. 9,27. 8,25

Section 107.1. 84,9. 67,5. 53.

Code couleur

-tableaux principal coefficient global $k_s \times k_u = 0,69$

$IB = (80 + 60 + 100 + 50) \times 0,69 = 20$ coffee regime normal

- etude d implementation d une ligne a haute tension our a Tres haute tension lignes aeriennes construction presentation.

- l' etude d implementation d une ligne Mele etroitment Les etude technique aux procedure administration le processus complet depend des regle en usage Dan's chaque pays cependant facing procede n EST .

- l objectif poursuivit burns dbentendu realiser une ligne electrique fiable court minimal Mais s integrant parfait email Dan's l environnement l evitment des obstacle eat difficult de passage fort que Tracee evitment des obstacle eat difficult passage font que rarement une ligne droite lots de procedure administrative le parties mise hey sont

-les representant de l etat .

Les ministres chargés de l'électricité et de l'urbanisme.

Les autorités régionales préfectorales.

- Les autorités militaires. Les élus Avec député Les sénateurs le Conseil général public à EC Les associations et organisations Les exploitants propriétaires.

- calcul électrique logiciel note calcul

Électricité haute et basse tension éclairage public Bureau d'études.

- calcul logiciel pour l'étude réseaux Haute tension alimente courant alternatif pour de tension comprise entre 10000V, et 246kV IL réalise Les dimensions électriques Selon la norme NF 13-200 et IE 60909..CEBEC

8.2 requirement dimension réseaux haute tensions en fonction de la source d'alimentation et quel que soit le mode d'exploitation du réseau mode Avec configuration court circuit minimum maximum mode normal ou perturbé et possible réaliser fonctionnement différent,

- la dimensionnement de câbles en fonction des courants admissibles et des contraintes thermiques ,

- le choix de réglage de protection .

- le calcul des temps de fusion des fusibles selon courbes de fabricants .

- les courants de court circuit maximum subtransitoire , transitoire perméant triphase et biphasé symétrique , ICC Crête courant coupe courant permanent et défaut terre .

- les calculs des chutes de tension dans les canalisations électriques et aux bornes des récepteurs en régime d'établissement et au démarrage de moteur. longueur du câble

- résistance électrique spécifique $I = P/U$

Section câble effective.

$A = I_{\text{eff}} / U_a \dots U_N = 12V, P = 100W, L = 18,8$ long conduit câble 1.8 m long conduit câble 1.8 m

$2.I = P/U_N > 100/12 = 8,3A$.

Section conduit câble

$A = I_{\text{eff}} \times l_{\text{ua}} = 8,3 \times 0,018 \times 18105 = 0,54$ m . normalise $l = 1\text{mm}$

$J = I/A > 8,3A/1\text{mm}^2 = 8,3A$ densité.

- les dimensionnement des appareils de protection Les courants de court circuit nécessaires aux choix de caractéristiques assignées des équipements et ou réglage de protection.

- le calcul des courants de court - circuit (ok) par la méthode des impédances (NF EN 60-909) et partie 4 NFC 13-200

- l'ensemble des calculs réalisation par sont confirmés aux conformités avis technique guide pratique utile calculs des normes CEI , 6050202- et VDE 276. Modéliser l'installation schéma unifilaire Avec affichage

- dimension une Maison . Tenir compte de la taille de Maison pour dimension.

- principaux critères pour dimensionner installation

- Dimension normalisée

- dimension en fonction

- Nombre d'équipement

8.1 étude différent affichage des équipements des Données et résultats pour dans le schéma étudier, Poste de livraison moteur générateur , le calcul font la synthèse case plus , démarrage, impression dossier.

- caractéristique de Tous Les équipements fonctionnement le calcul des courants de court circuit en Tous points

- de l'installation et vérification des conditions normatives des câbles en fonction de routes .

- répondre aux obligations réglementaires attestées

- informations générales Sur projet.

Carnet de câbles au format tableaux .

Schema unifilaire des installations note calcul

- réalisation atout optique HT.

Rapport de calcul hr .

Plusieurs postes Avec une touche HTA et plusieurs configurations de fonctionnement.

- réseaux de distribution jour et au fond d'UN mine .

- une partie du réseaux de distribution d'une usine .

- alternateur asynchrone, alimentation de poste satellite, borne point neutre bpn , courant d'enclenchement des transformateurs.

- Calculate du courant admissible Dan's la boucle .
- valeur de reglage de disjoncteur .
- valeur de faut des courant capacity.
- valeur de reglage des default homopolaire.

2.Fonctionnalites principales:

-calcul effective Selin Les normes .

- mise a jour des calxuls en temp reel,
- Haut tension et base tension .

Dimensionnement et verification, dimensionnement cable cable , variation de Vitesse ,appareil Trace software.logiciel pour la conception le dimensionnement installation haute tension base tension .

- Cree Les chema unifilaire d une installation Electrique hair base tension .
- applique Les normes national et ou international corresponding pregnant en compte.
- Les source et charge Les reglage protection ,la selective,la dilation et .
- obtenir et personnaliser Les information note issue.du schema et Les chema Avec Les schemas Avec levlogical Les Plus courant dubsecteur ,imprimeur Les note de calcul, international,reel ,Dan's le meme projet d 'arcs electrique,d une installation Electrique Transpo (HT/htb..

8.2 note de calcul Bureau d 'etudes .

- **realise une note de calcul Sur measure** pour reponsre aux besoin specific des industries et simulet tester virtuellement La terre.

Quece qu une note de calcule EST UN report calcul numerique systeme our de la piece en consition.

- calculatation des structure statiaue dynamics
- correlation calcul essaies .modelisarion .note de calcul sismique pour test la tenure aux seismes.
- livrable Sur calcul vibreur .
- tenue mecanique d une piece of d une effort et verifier si la piece Casse our non .,note de calcul Sur du thermique validation d UN nouveaux .
- billan de puissance Avec prise compte de coefficient de faisannement .extension .
- Gestion de la filiation et de la limitations.
- calcul des chute de tension,repereage auomatique St Manuel xomposant ,
- generation auomatique de la documentarion.
- generation auomatique de la .edition notes de calcule y compeis de note.
- base des Donne's constructeur .
- Gestion des borne Irv,1720.

Attributiin auomatique.module.

Coordinatiin simulation des different default de court circuit , contril de conformity , integration de Conte Sur boire optimisation

8.3 Bureau d etude . Marche European note calcul des Structure metallic Dan's l envelope du batiment euro code bureau base de calcul.

- action air Les structures,calcul des atrure beyond, calcul des structure en acier, calcul des Structure acier, calcul des Structure mixtrs,calcul structure Bois, calcul des ouvrage en maconerie ,calcul geotechnical, conception dimensionnement,calcul des structure en alliage d alluminuim ,constitue des reglaes train champ application charge de beige action thermique .
- une Vue de la Structure,Les relanchement des Barres Les conditions aux appuies ,numeration de noeud et Barre.,coordine de charge resultat reaction aux appuies aux deplacement aux contraint aux effort internet calculate

-8.7 calcul des charge du reseaux electrique.

- calcul ecoulement des charge Dans le reseau suit a la construction nouvelle station.
- Mission vise calculer le courant des ligne et Les tension des noieds apres la construction de plusieurs station electrique et l about de Gros consommateur.
- elavorer la strategies patrimonial a long term du Parc,analyser different options contractual pour le renouvelle.
- demarche et results.missiin repose Sur la modernisation reseaux electrique .calculatation et simulation Group permettre Lance de calcul electrique chute de tension cable et transformateur en contraint intensity maximum.
- principales fonctionnalites.

Cartographie topologies de reseaux import dear information de la base abonne puissance souscritw consomation.personnalite de simulation de calcul Avec ajoute une extension visualisation graphics solutions collective.

- domain

9.required domain d 'application distribution resaux ;

29kv,r 49 ohm bovine j 49 ohm

-presentation plan protection hta troncon depart depart hta hey de Barre hta transo htb ,E=EMF,Zd= impedance direct reseaux court circuit biphasé default Se site entre Les phase 2 et 3j1=0=-j3.j2 courant circular Dan's le phase system omopolaire phase et la terre 2j2,=-j=(a-a) Ezd+z,. a=EJ.2π/3 Les impedance zd et Zi sont égale a d our ICC bophasée = j29 =oj30=√3.E2.zd.√3 ETA t inferieur a ICC,biphasé EST inferieur a ICC 2 triphasé ,

Default biphasé ayant une resistance negligeeable EST limited par impedance dear element dubreseaux ,iccb= UN 2.√Rl2+(xhtb+Xtb+xt.

Reglage des protectuin d une arriver.ioDS= jcw.vi.10a=Vo.O.iod= vi+j(r-cd)

_required. Protection dun alternateur , protection contre Les surcharge , protection contre Les court circuit ,

-parametre dimensionnement dielectrique d UN group.

On: puissance due moteur thermique ,UN : tension assignment fournie par l alternateur ,In courant assigned fournie par l alternateur ,

Ach principal d' in group electrogene analyse course protection norm our Les besoin dear application ,reglage protection surcharge au long retard dbouvien coirbe surcharge.

- pour raison economique levomotwur thermique d UN grouped replacement peut etre atrictment dimensioned pour sa puissance nominal s IL ya une auxhage de puissance active le moteur diesel. Billan de puissance active des charge prioritairw,une grouped de production doit pouvoir support Ter auxhage d exploitation auxhage d exploitation ,surcharge pour une Marche uni horaire.

-aurchage pour une Marche routes regime uniform.

Protection contre le court circuit s.

-les courants de court circuit eat d une courant aperiodic d UN courant sinusoidal ,irms..in..3..

Regime subtransitaire,regime transitaire,regime permebt,alternateur Avec excitation compound surexite alternateur

- regime subtransitaire apparition d UN court circuit aux bornes d UN alternateur,Les courant s etablit d'abord a une valeur relativement elevee order 6a 12In pendant premier cycle o a 20 mile second l amplitude d une Tel courant de court circuit eat definite par,

-rea tamce subtransitaire de l 'alternateur.

- le niveaux d 'excitatiob prealable instant du default.

- l ' impedance du circuit default impedance court - circuit de l alternateur a consider t la reactance subtransitaire Xd second expeime en % u. Tension phase neutre par la construction XD ohm = UN xd/100s

S=√3 Un.In..

Regime transitaire: Se site de 100 a 500 ms apres l apparition du default partire de la periode jusq 15,2fois le courant In

- le courant default pendant 10 second habituellement a 2 a 3 fois le courants.

- Plein charge de l alternateur calcule charge deb l alternateur .

Calcul du courant de court circuit. Les constructeur precise en general Les valeur des impedance et constant necessaire analyse de fonctionnement en regiment transitaire our permebt debvaleur d impedance en %,Selin dear puissance a d 'alternater.,. KVA 75to 500, XD ,XD transitairexd permenebt,resistance etant toujours negligent deviant Les reactance intensity de court circuit en periode ,

icc3=U0/XD.1/√3..XD en ..

Icc3=In/XD .100.(xden %)..Ce valeur sont a rapport du courant de court circuit aux bornes d UN transformer

..dv/St and .Di/St..MOSFET gate different driver for electrique machine .breaker

- pour une meme puissance Les courants en CAS default proche d UN alternateur seront 5 a 6 fois plus faible que ceux cette difference EST encore Accenture par le fait que le groups electrogene our en general lorsque le reseaux BT eat alimente par source normal de 2000kva le courant court circuit eat 42kva aux niveaux du jeux de Barres BT eat alimente par la source 2,grouped replacement de 509kva a reactance transitaire de 30% le courant de court circuit s etablit a 2,5 KVA environment soit une valeur 16 fois plus faible que Avec la source normal....peek

9.1 peak dv/St..Di/St turn on off dv /St .

Inductance definition derivation type quality metal iron cobalt non iron element , magnetic flux that is proportional to the rate of change of the magnetic field is known as induction, the amount of inductance required produces to an end could .
Factor influence inductance.

1 the inductor wire has specific number of turns.. the material that was used to make core core appearance , Faraday established the electromagnetic inductance law, derivation of inductance look at a DC source that has the switch turned on the current flow from zero to a specific value causing a change in flow rate consider flux shift current flow measure in term time $d\Phi/St$ use Faraday law of electromagnetic induction to solve the problem

$$E = N(d\Phi/dt)$$

$$E =$$

French version 8. Requirements: Study office workstation: Home troubleshooting and electrical installation On renovation our new, bringing conformity of electrical panels, _ for the protection of personnel installation of UN Adequate number of 30 mA differential switch against incs die installation of circuit breaker reset to safety standards, eliminate the risk of fire and or ekecteisation of personnel related to use of a faulty electrical installation, - check installation if necessary - elimination of faulty plugs and switches of poorly insulated cables, intervention on high and low voltage, troubleshooting, installation in Voice dinners, 8.1 biocompatible electricity, information, measure electromagnetic, mourn product - measurement and analysis of electromegnetic fields, Effect On Health CEM Liew exploision. - prevention and curating spectrum abnormality issue. -CEM base frequency HT line and 230v distribution, HT distribution domestic microwave equipment pulse telephone Relay, telephone, detect WiFi, Bluetooth, - when the measurement of electric and magnetic fields is frequently given priority during the course, - Measurements measure the resistance of your earth, Measurement of electric fields and magnitude. - the measurement of high frequency magnetic fields realization of a cartography of the electromagnetic pollution at your dwellings a completed study carried out in relation to information on the standard risk and sensitivity threshold, proposal for a solution to the problems consents 8.required: -dimensioning and cabling of cable, which relief All the components of an electrical system These are the cabling supplying the energies power source the distribution to the devices to the Light - type of circuit: voltage drop at 10% non-critical 0.6m,,51-61,, - chutw voltage at 3% critical 5A-200a, 0-2m, Gauge: current way AwG American wire gauge method standard for desigule diameter of wires EST measuring the diameter of the conductor measures only run wire, without insulation ---- gauge file .Europ, norm AwG 00,000,00, Diameter mm 11.68,, 10.40. 9.27. 8.25 Section 107.1. 84.9. 67.5. 53. Color code - main tables overall coefficient $ks \times ku = 0.69$ $IB = (80 + 60 + 100 + 50) \times 0.69 = 20$ normal coffee regime - study of implementation of a high voltage line or very high voltage overhead lines construction presentation. - the study of implementation of a line Mixed closely The technical study with the administration procedure the complete process depends on the rules in use in each country however facing process n IS. - the objective pursued burns relaxed to achieve a reliable electrical line short minimum But integrating perfectly email bet hey are - the representatives of the state. The ministers in charge of electricity and town planning. The prefectural regional authorities. - The military authorities. The elected With deputy The senator The General public council at EC The association and organization The operating owner. - electrical calculation software note calculation High and low voltage electrical public lighting Design office. -cance software for the study of high voltage networks supplies alternating current for voltages between 10000V and 246kv IT realizes the electrical dimensions according to the nf standard. 13-200and ie. 60909..cebec 8.requirement network size voltages depending on via power source and regardless of network operating mode With configuration short circuit minimum maximum normal mode or disrupted and possible to achieve different operation, - the sizing of cables according to the admissible currents and the thermal constraints, - the protection setting Seoul. - the calculation of fuse melting times according to manufacturers' race. - the maximum short-circuit currents, subtransmission, three-phase and symmetric two-phase permanent transit, ICC Peak current interrupting permanent current and earth fault. - the calculation of the voltage drops in the electrical pipes and at the terminals of the receivers in the establishment mode and at the motor marriage. long length of the cable - electrical

resistance specified $I=P/U$ Effective cable section. $A=I_{xez}/U_a$ $U_N=12V$, $p=100W$, $L=18.8$ long
conduct cable 1.8 m long conduct cable 1.8 m $2.I=P/I_n > 100/12=8.3A$. Cable conduit section
 $A=I_{xez}/U_a=8.3 \times 0.018 \times 18105=0.54$ m .normalized $1=1mm$ $J=I/A > 8.3A/1mm$ $s_q=8.3A$ density. - the
sizing of the protection devices The short-circuit current necessary for the choices of characteristics
assigned to the equipment and or protection settings. - the calculation of short - circuit currents (ok)
by the impedance method (NF EN 60-909) and part 4NFC 13-200 - all the calculations carried out by
are confirmed with the conformity technical advice guide pr

.10.of electromagnetic induction to solve the problem :

$E=N(d\phi/St)$..where n is the coils number turns write equation

$E=-N(d\phi/St)$.. $E=L(Di/DT)$ $HI=NI$..denote the magnetic , $B = \mu.H$... $l= NBA/H.f$

$L=\mu.N^2.A/L = \mu.N.\pi.r.r./l$...

Type of induction the magnetic flux associate with a coil or circuits change any type .

- coefficient of self induction the current is proportional to the number of flux linkage with the coil, $N\phi$
is directly proportional or $N\phi$ is the number of turn could coefficient $L=(N\phi/i)$.. $I=I$ amp.. $N=I$ $L=\phi/I$,
Faraday $N(d\phi/St).e=-l(Di/dt)$ and.

Units and dimensional formula of l it's S.I unit Webber / amp =joule Amp ,coulomb x volt amp = volt
sectbamo = ohm x sec ,, $M=M.L.L.t.r.A.A$

$M=K.L1.M.L2$.magnetic series.. $L_a=L1+L2$... $l_a=l1+l2$

$L_a=l1+l2+$ parallel , $l=6H$,. $F=70HZ$, $x=2.\pi.f.l$ $x=2 \times 3,14 \times 70 \times 6=2637,6$

..calculus question . $f(x)DX$ calculus according to the ohm low formula for a capacitor , capacitor
currents is proportional to the time derivative of capacitor voltage, $I=C.dv/St$.. capacitor
differentiative voltage with respect to time and this time derivatt voltage of voltage.

advanced calculus instataneous rate of change of an (x,y) ..[Dy/DX]. , $I=E/E$,,, $G=1/R$... $I=C.de/St$..variable for current (I) and voltage.

- Capacitor store energy in the form of an electrical field, calculate the energy stored in a capacitance
by integrating the capacitor currents ($p=I.V$)..over time since we know that power is the rate work
(w) is done work from (w) is done work from zero voltage , $P= dw/DT$,, $dw=P.dt$capacitance (c)
and voltage + v) into the integrand energy capacitor capacitance,

integrak . $f(x)DX$.. DC input output ... $dvout/St$..[v.in](#) ..integral

. integral out ..integral .To vin dt...

$R=dv/Di$.. equation diode... $x=Dy/dt.(x)$.. $y=I/int.dt$

-application electrotechnique circuit rlx transformateur eclairage

Log activity day	Care day	Description calcul	Close calculation	Yes/not

11.required : besoin en energies de reglage dimension.

-determination des besoins en puissance de reglage secondaire et reserve de minute ,

- la puissance reglage secondaire et reserve minute a reserve sont dimensionnement.

-conjointement par le quote date de livraison ,le dimensionnement EST plus effective trimestriellement pour le trimestre au Mais individuel

-desequilibres historique du system Les pannes Se central sont exclu .

- probalite statistics de faillance des different type centre d une puissance en compte 100mv ,

- classification de dinners d entre heur date Mais jour Ferrier , details de la procedure de dimensionnement,sont disponibles Dan's la is Sur le dimensionnement dynamic tranche horaire de jour

- dimensionnement des besoins fcr

La puissance de la frequency contrainement reserve maintenir par la get allement gestionneur reseau ,

- quantite total syst internet ,Dan's Les aystt interconnected d Europe continental resulte de la pertubatiin de +-3000Mw ou d' une dimensionnement probaliste tenant compte de diffet facteur influence doit garantir que la

12.1 electricite ligne a haute tension ..production

,Total estime TWh,,nuclear estime % ,hydraulic au file d way ,autre renouvela le, thermique a flannel % non renouvelable, thermique a flammable,

-consommable totalperte, finale,par habitant TWh, manage agriculture , industries,service %,.

Transport services , commerce %, commerce exterieyr importation TWh, exportation twt ,

-Energy relever des compteur et calcul de la consommation ,gestionnaire de reseau distribution,

- lire Les index Sur Mon compteur d electricite our de gaz.

-fiche pratique,relever estimate 9209meter cube, chiffre 23355kwh ,si Mon compteur electrique a deux Plein heure , heure Creuse, Je relevele x chiffres indique numero compteur ,15,237kwh,, 12458kwh ..

12.2. Measure des harmoniques Dan's Les reseau electrique, procedure pour l analyse harmoniques du reseau ,

-action correctives ponctuelle,action preventive a long term ,

-Quel appareil pour mesure CES indicateur ,

-Quel rang d'harmonique procedure pour l analyse ,harmoniques du reseau ,measure des harmoniques realise Sur site industrial.

-A titre preventif a fin d 'avoir une Vue globale Sur l 'etat du reseau. Cartograph du reseau,

-en Vue de mesure corrective a fin de termine corrective a fin determine l'origine perturbation solution require pour l eliminer,

-port verified la valide d 'une solutions a la suite de modification Dan's le reseau de distribution pour verifier la reduction

- Les indicateur harmoniques peut etre mesure expert present Sur la site pour periode temp limiter par instrument de mesure installed fonction pendant UN temp period au dispositive determiner.

-action correctives: lorsque pertubatiin sont observe harmoniques sont suspect de mesure ,courant et tension sont effective aux niveaux de la source d'alimentation heux de Barre du tgr Sur chaque depart tableaux general ,pour de result fonctionnement installatt etat batteries condensateur Nombre de garden ,

- determiner l'eventuel declassement necessaire des equipment.

-determiner le calibre de routes Les system de protection et filtre necessait d emission harmoniques maximal admisst

Action preventive a longu term.

- permenebt mesure ,measure certain Nombre de point, different installation Sur period situation.

-fluctuatiin source d 'alimentation.

-variation Dan's Les fonctionnement ,ajout de Nouveau equipment,

-des appareillage mesure installed aux reseau de distribution permettre des appareils des mesure installed permanence directent Suive .

-poye une Evacuation global de l 'etat du reseau analyse preventive,

-la location de material de mesure l 'appwl expert ,la connexit et deconnexion,d 'eqyipement de mesure pour l 'evaluatio. Global de l etat du reseau, l analyse Sur le tableau general,base tension oar l 'appareil arrive et ou appareilmesure equipe chaque depart ,

- pour Les action corrective IL EST possible ,determine le condition foncty ay moment de l incendie,

-desser une carte reseau evaluation mise ouvre.

-quel appareil pour mesure CES indicateur a,Les appareil mesure dournisse des information valeur

instance harmoniques, sont connues selon norm CEI 6100-7..CEM.. technique d'essais, this angle tensions indicateur long term 10minutw, period 1 semaine, tension harmoniques maximal norm en 50160 caracterisa valeur .

- harmonique impairé non multiple, rang, ampli relative,
- harmonique impairé multiple de 3, amplitude relative UN ,
- harmonique pairs rang amplitude relative ,
- instrument portable oscilloscope, indication distortion courant , analyser numerical Fourier alfo I - U , 10 sys , 50hz 12 period 69h
- les cout des perte du transformateur court annuel du pertes .
- les lertes annuel d UN transformateur eat evaluee for

$$W_{perte} = (P_o + P_k \times k.k) \times 8760..$$

W_{perte} Montana des pertes annuelle en kWh .

- Po: pertes a video en kW ,
- Parameter , specified Dan's .

La caracteristique du transformateur ..Pk perte en charge en kW , parameter specifies envdans le caracteristique du transformateur.

- k: facteur de charge ponderee Sur l 'annee ,, 8769 : Nombre d' heures de fonctionnementlm.

Dan's l 'annee (24/24,365jl.)

- decharge ponderation Sur une journee Sur site industrial ,

Facteur de charge , pondered,

- Sur UN jour (1440 minute) de charge

Formulae $\sqrt{\sum t-1440, t=o..k.k.indice k \times t..}$

$$\sqrt{(0,3) \exp 2 \times 150 + 0,65 \exp 3 \times (240 + (0,85)(0,85) \times 330 + (0,5)(0,5) \times 90 + (0,85)(0,85) \times 510 + (0,3)(0,3) \times 120) / 1440}$$

- chargr pondered journaliere eat Alor 0,724.
- chargr pondered annual vaut

$$\sqrt{j365 \sum j=1 k.x.j / 365..}$$

CTA pertes = C × W pert X (1+I)exp n-1/I × (I+I)exp
- court total acualiae de Perte.

C: evaluation du court Moye. Par kWh par an ,
W Peete , perte annuelle

I: taux d ' actualization,

n : durede vie esperesy trans global dea transformateur evaluation economic l achat d UN
tranafo ,actualisation Cour global long sure vie achat

-CTO=PP-AxPo+Ok..

..pp :court d' achat du transfo,

A court perte a video ,Po total perte a video (€/w).

B: Cour de perte due charge exp €/w

Ok: perte du charge gaewntie .

A=Ckwh×8760(I+I)expn-1/i×(I+I)exp .n ..

B=Ckwh×8769×k×k(I+I).exp.n/1×(I+I) exp.n

-I: taux d actualisation (%).

n:sure de vie en arc.

Ckwh : prix du kWh (€/kWh)...

8760: Nombre d 'heure de fonctionnement Dan's l ' annee 24/24,365 j ,

K:facteur charge pondered ,selecteur industrial, UE -27 charge moyen ,40%,70,%

-donne,

Type du transformateur 1000kVA ,

- charge moyenne : 65% (24/24)

-cos n moyen de la charge :0,90.

- Suree de vie economique 29ams ,

- Cour de l ' energy : 0.06 euro

12.required: NF..50464-1

-1pertes a video ,perte did 14000,perte coc 1100, perte Bob,perte Aop.

-2 perte du charge a la charge ,perte DoD,perte coc,perte perte,

3.cout indicator ref DoD ,perte DoD ,perte perte ,perte A,a

4.perte annuelle kW,

5. rendement perte.98,95, pertecox 99,16,98, 99,39
 6. Perte a vide ,12264,96368234,6745,
 7. perte due la charge kWh ,48114,38862,33319,
 8. Total kWh ,
 9. xout annuel de perte, perte Vue perte charge,,

14..Billant matiere ,,concentrateur ,indicateur . cuivre revenue, rejected 100% plumb
 .metallurgie luxiviation.. geotechnical
 1

to

15. probabilté d UN evenement EST Nombre d issues favorable devise par le nom re d issue total .

$P(A)=1-P(A), P(A \cup B)=P(A)+P(B)..$

.. 15.1 required: Usinage fabrication une mecanique qui necessite une interrupter et fusible Vue que l usine achete CES componasas electrique en Grande quantite., des interrupter achete soient defectueuse ingenieure qui travaille recolt dinnwr, Sur la defUlkan e de CES appareillage don't certaines sont resume,

-defectueux interrupteur 6, fusible ..total

-no. Defectueux interrupteur 182..fusible ,total,

-total interrupteur ,et fusible 208.

-probabilité q UN interrupteur soit defectueux , -su la probabilité q UN fusible soit defectueux EST une fusible soit deferues EST 9,9625, combien de fusible soit bon , Sikes interrupteur et UN fusible defectueux ay

hazard , en deduire la probabilité xhouaire in interrupteur our d UN fusible qui be fonctionnement

pas, diviser nom re des interrupteur Nombre d interrupteur Somme des Nombre interrupteur defectueux

, 6-182=188,

$P(N) = 6/188 = 3/94 = 0,0319$ si la probabilité q UN fusible soit defectueux de 9,0625 ..soit avenement f qu UN interrupteur soit defectueux $1 - 0,0625 = 0,936..$

15.1.required: need for dimension adjustment energies, -determination of secondary control power requirements and minute reserve, - the secondary adjustment power and minute reserve

to reserve are dimensioned. - jointly by the delivery date quote, the dimension IS no longer effective quarterly for the quarterly individual but - System history imbalances Central Se failures are excluded. - probability statistics of failure of the different type of center with a power of 100mv, -

classification of dinners between time and date but Ferrier day, details of the sizing procedure, are available in the dynamic sizing time slot of the day, - sizing of fcr needs The power of the frequency

constraint reserve maintained by the network manager get all the way, - total internet system

quantity, In Continental Europe's interconnected systems result from the disturbance of +-3000Mw or

from probabilistic sizing taking into account the diffet influence factor must guarantee that the 12.1

electricity high voltage line ..production ,Total estimated TWh,,nuclear estimated %, hydraulic in line

d way, other renewed, thermal flannel % non-renewable, thermal flammable, - total consumable loss,

final, per capita TWh, manage agriculture, industries, service %, . Transport services, trade %, foreign

trade import TWh, export twt, -Energy reading meters and calculating consumption, management of

distribution networks, - read the indexes on my electricity or gas meter. -practical sheet, find estimate

9209 cubic meter, figure 23355kwh, if My electric meter has two Full hour, Off-peak hour, I relevelea

xhiffres indicates meter number, 15,237kwh,. 12458kwh.. 12.2. Measurement of harmonics Dan's

Electrical networks, procedure for the harmonic analysis of the network, - one-time corrective action,

long-term preventive action, - Which device to measure CES indicator, -What rank of hanarmoric

procedure for the analysis, harmonics of the network, measurement of the harmonics carried out On

industrial site. -As a preventive measure in order to have an overall view of the state of the network.

Network Mapper, -en View of corrective measure at end of end corrective at end determines the

origin of the disturbance solution required to eliminate it, -port verified the validity of a solution

following modification in the distribution network to verify the reduction - The harmonic indicators

can be measured by an expert present on the site for a temp period limited by a measuring instrument installed function during a temp period on the device to determine. - corrective action: when disturbances are observed, harmonics are suspected of measurement, current and voltage are effective at the levels of the power source hey of the bar of the tgbr On each departure general table, for the result of operation installatt state capacitor batteries Number of garden, - determine any necessary downgrading of equipment. -determine the caliber of roads The protection system and filter required maximum allowable harmonic emission Long-term preventive action. - permenebt measure, measure certain Number of points, different installation On period situation. - fluctuatiin power source. - variation Dan's Operation, addition of New equipment, -measure devices installed in distribution networks allow devices to measure installed permanance derectent Follow . - poye a global Evacuation of the state of the networks preventive analysis, - rental of measurement equipment for the appwl expert, connection and disconnection, measurement equipment for the evaluation. Overall state of the network, analysis On the general panel, low voltage where the device arrives and where the measured device is equipped each departure, - for corrective action IT IS possible to determine the functional condition at the time of the fire, -draw an evaluation network card opened. - which device to measure CES indicator a,The measuring device provides information on instance harmonic values, are designed according to norm IEC 6100-7..CEM.. test technique,this angle voltage indicator long term 10minutw,period 1 week,voltage harmonics maximum norm in 50160 characterized value. - non-multiple impaired harmonic, rank, relative amp, - harmonic impaired multiple of 3, relative amplitude UN, -harmonic even rank relative amplitude, - portable oclloscop instrument, current distortion indication, numerical analysis Fourier alfo I - U, 10 sys, 50hz 12 period 69h - the cost of transformer losses short annual losses. - the annual letters of a processor are evaluated for $W_{loss} = (P_o + P_k \times k.k) \times 8760$.. Wloss Montana of annual losses in kWh. -Po: video losses in kW, Parameter, specified Dan's. The characteristic of the transformer ..Pk load loss in kW

16.requirement : function functions..

Psychology's b, function job analysis function job analysis is the examing job requirements ,and assigning the right conditions, qualifications no rwing condctu no arm ,lifting ,
 -functional job analysis is method used hr (I/o) psychologie expectation of their specifical position private .
 -project work job roles that requires intermediate math skill essential job roles call ,job role alarming state math skill ,job roles for those with intermediate ,how to use intermedt create an assessment group arround ,valuable and important resource in any company job emphasis on qualitative assessment.
 -work or conducted that require cooperation between management compagny and its workers a typical compagny workshop ,communication verbak Please to grade the output employer,

- Different classification system for the position analysis question Aire is standard position.
- fonction : job analysis is qualitative assessment form Which means focus combine organisation impact overall operate conducting assessment,
- Compagnies and organisations scrutinise virtually .
- the scale of workplace definitely.

The are many ways to conduct functional occupation analyse but measure scales data thing instruction ,scales reason ,math language, resource, employee supplier to employees job physical measure , qualifications measure ,

- psychomotor : and psysical requirements of job the job analyse survey is mostly used rate the fonctionni requireded of job rating. The function AI rating analyse process may occupation analysis,
- job description: ,resulting from the primary resultat of a job analyse job session is new job description function hr DEP ,security duty statement offer.
- Categories of information regard both job prospective,things data worker instruction ..

Function job analyse :user computer to collected and collate data and draw conclusions, constructy worker use home physical tools to accomple building task,the tools must be as up date as possit collective conditions candiat for position,process relevant compagny work instruction basic , completed .

Function in the real world when we introduce student to the functions we typically bring the concept to life through the idea of function machines but function.

Function machines s: students easily grasp of funct machine input something happen .function rules and input can predict the output determine the input image imagine if input ..metaphors event nby setting a large card input slot machine mysterious function rules,student input the class ,input 4,5 Output 5,15..find the composition function in loving 2or more functy the teacher or student create spread sheet function machiy, job functions sound ,job title ,job read roles

- job function meaning: wath is the purpose of job functions is a job positions to give completed description of the primary responsabilite ,the empee will perform we define,job functions as a detailed list of employee action and duties part the roles job function ..job function vary position but list job supervisor department team provide support training to support meme er protocode for increase maintence a working document.of best practices,report to director: job it clear great ,job function ,work function essential work function essential functions work funxty .job it clear great .job function essential functions .
- job function vs job titles a job function is usually list of responsabilite ,job title ,tags ,job description job content,job descript management..
- gradie t in real life ,part wath is a line line extend fevere beyond director a line segments ray end point , gradient of a line .want to keep learning math subject knowledge graphs function solving equations..

$Y=4x.x.x-2x.x+7.....0$ point (1,9)

Take derivation respect $12x.z-4x...coordone (x=1)=...x$ gradient = $12(1)+1)-+4(1)=8..$ gradient function (1,9)is 8

- to find the gradient of function point slop point derivative point ,find vector function .problem to calcule gradient of this loss function ..
- .c (y,w,xb) $1/n,nsum..I=1$ max find derivation vector is network dual quantity neural matrix operatt .
- Gradient of scalar function ..

$f(x,y)=3.x.x.t$ hange to change function partial derivatives..gradient

$g(x,y) ..matrix ..y1=F1(x)=X1. .y2=f2(x)=X2, yn.fn(x)=xn$

17. Requireded: calcul taux de charge eat le rapport en pour ,du courant preleve aux borne du disjoncteur ceat Somme des courants transitaire Dan's Les canalisatiob different Sur courent nominal transfo.

-Inontra transfo= $I1+I2+I3+I4..$ Disjonc transfo 400kVA,, charge different ..
Heure,, depart 1phase 1.2 3 amperage

14h00
20h00..

18.required : government .minister deputy government . framework mandatory compulsory student
[order.in](#) order to determine research college order to work.and regulate
- home affairs department.general requireded work visa for temporary se jour time .v.fs.apppinrment
letter completed valid ,pass port ndp critical saqa ,webmaster ..
Education department dhet basic..permit student .
Council education council trade . engineering council
Department labour and public work
Development.skill...juatice development
Power attorney.dol
I fracture social development

Department defense .police safety security
Sandf.saps psira seta permit bargaining sector competency fire arm gun operational

-dti department trade industries.sector non proliferation the department of trade industry ,of weapons
mass destruction council ,regulate strategic, protection interest , government control ,
implementation student workshop place visited ...

-Dmr.departement mineral energy..electricity sale revenue and prices power plant ,fuel
use ,stocks,electricity independ ,national treasure economic sars department of energy mandate
responsible ensuring private sector participation in pour generation through competition bidding
process come regularity primary source development electricity sector
-department of science and innovation ,socio economic development goal,resource scie bono center
career.

Programme administration technology innovation cooperation.

- programme research development support.

Purpose knowledge.,strategies,objective, developed humain generation components

Basic science infrastucture implementation of research inovation equivalente,science .mission .
astronomy.

R tax incentives ama.

Department economies sars economies empires ..

- national energy regulator of South Africa authority mandate ista regulate the electricity piped gaz
and petrol ,consolid jurisdiction Coe chief officer legislation , invitation to comment amendment 3800
mW ministerial determination invitation comment net billing rules development , tribunal,info@ nersa
organ.

- electrical conformance board ECB, South Africa ,designer ,installer and the regulator custome ,

- for profit find reseller cocs ,outlet online keeping for your client ,tech competence implementation
dissemination stand ,address,standard,,,

Department economies:

How much is the total power supply consumption of ATM click 24;,5,52kw,,

Uniterptibke power auplie in banking and finance sector power challange ATM ,cost consume ATM
1,3kw auxiliare automatic teller machine ATM custome size,

18. Required: energetical electrotech energy and electroenergetical ,mass government , weighting government products v

net metering basic, metering credit , calculation and billing , designing net metering facilities, common mistakes, minimum, monthly reliability , additional resource , mass

- renewal .electrical company state low

Required.

-distribution company ever source and private megawatt ,,national grid , electrical and private cap megawatt.

-small hydro electrical

- class number and size private facility

-class1 metering and 60kw or less.

-class2 , 60 kW ,mW

-class3 metering facility ,2mw,type, sust ,assurance metering docket system rules single parcels sub division,owner or operator , municipality ,10mw ,self designed company mystek .

-eskom entrepreneurs commissioner electrical split meter program, Eskom Gauteng electricity network infrastructure upgrade programme ,main objective initiative, reliability uplift and empowering them to control and manage their consumption is currently rolling out smart prepaid meter in Sandton specific targeting ,mall programme , consultation process , meeting, customer educate , customer awareness, fortune ward meeting, explaining benefit free basic electricity , Bloc tariff .

The meter company, customer interface unite ,smart prepayment split metering solutions, remotely, display, smart meter , allow, capable two way communication, between customer road , information meter , programming updates, automated , instruction sent to the meter to interrupt,

-the power supply prepaid ,

-meter/demonstrate//CIU///

19.1 Circuit diagram of analogies energy meter:-

System input phase parallel act DC power supplies, counter kWh , load side

Line voltage, PGA or, ADC2, ADC1, X, and digital ..residential outlet.

- system control =1, display =1, quadrant metrology processor =1, voltage sensor =1, current sensor=1, terminal block=1,

-digital energy meter , power supplies yes and max 2,3,2=1, Db connector =1, smart card reader , micro controller =1, optocoupler =1, load digital energy meter , relay , LCD, main supply

19.2 requirement: ATM term standard automatic teller machine it an electronic device that is used only bank customer to process account transaction the user access their account their account through a special type of plastic, card that is encoded with used information on a magnetic strip contain an identification code that is transmitted to the bank central computer but modem the user insert the card into atm to access the account and process their account transaction invented by John Shepherd in 1969..

Block diagram for atm machine system ,

-start yes, walking to insert card yes, insert , waiting to enter yes the pin yes, waiting to check to pin yes , waiting to enter amounts yes, waiting to enter amount yes, verify balance yes, get cash, in correct pin eject,

-users or engineering entry exit hard , generic iso , IEC model for functional sizes measure.

Block diagram ATM ..

High security module yes memory test, key pad yes card reader yes ,etc yes central unit output lcd driver yes display yes, motor driver output yes, speaker driver yes, relay yes AC switch driver

yes ,ethernet yes and dsk yes communication,powerreser yes,power supplies yes standard device,
 -input device the input device like card reader and keypad,
 Card reader :the card is an input device read data from a card,card is part of the identification
 particular account number and the magnetic stripe on the backside of the ATM card is used for
 connection with the card the card swiped pressed ,jet pad,after machine ask identification unique
 balance inquiring pin so draw money

20.required:une case diagram for Bank ATM systems ,system aliw custome access clerk cashier
 or bank teller work ,step authenticak ATM plastic ATM card users name and pin ,user name and
 pin ,use case diagram for .

-check balance yes , deposit funds yes , withdrawal cash yes , deposit funds yes , atm transit yes ,
 extension point menus provide, custome yes, custome button yes extension,atmb..
 -enter card used name ,invalid,request ,with draw display ,case diagrams Bank ATM , maintence yes,
 repair yes,replanch yes up grade diagnosis,

-software engineering ,state transition diagram for an ATM systems,use case diagram for library
 management system,

-use case diagram for online banking.

-DFD for ATM systems,

-difference between use case and test case.

-state diagram for online banking system.yes

-Data flow diagram for online banking system.yes

-Class2 diagram for mall management system.

-class2 diagram for hotel manage system .

- class diagram for theatre management system .

-class2 diagram for bus standard.

-class2 diagram for airpor management system.

-Class diagram for scholaire.

-software class test .

- rules for data flow diagram.

- components basic diagram.

-short note activity.

Information system development.

.. components diagram.

Customer Console yes..ATM machine yes ,bank database yes ,card record yes, atm transit

yes,employee Consol yes ,client yes desktop yes,

- flow charter organisation concept map network diagram,use case mind mapping ,wire frame,

Orders yes, item yes, product yes, custome yes,

-----+++schematic diagram of the printer.

Inspect camera yes, pressure control yes,temperature control yes, amplification yes ,jet driver yes ,
 control yes system ,".y motion controller temperature control yes,

21.required : engineering electrical . machinery motor and generation AC DC

courent..transformer.relay contactor field electrotech..

.contents : nomenclature and name plate information..I'd permit,, step 1

-Dc motor theory ,step 2 disassembly ,step 3,step 4 armaturea, steps 5 frames, 6vemtilation and
 accessories,7step ventilation and accessories ,step 8 motor assembly and final test ,step on site

troubleshooting ,step faillure analyse ,step DC machine data sheet ,carbon bushes , current , density

and performance,step installation ,step startup and Basile information,step operational monitoring and maintenance,step motor and baseline installation data,how to read a motor nameplate,step motor storage recommand

-step how to rewinding and electric motor ,step disassembly motor , steps wipe off,step remove the motor ,step pictures step force armature ,step cut the old winding,tips enamel or nulon and polurethane coated magnetic wire ,

-step electric motor insulation papper,step utility knife step wire cutter,flat blade screwdriver plier lint ,free cloth work gloves , motor rewinding process,

+ 1 remove windings,removal insulation papper clean housing,burn remnant of insulation, prepare new winding ,on a spool,insert new insulation papper into housing ,papper into ,step solder and insulate windings end .plie off solder end ,varnish windings reassemble motor test.

-analyse 3 ph 3000rpm magnetic field , motor inscription board , motor nominal voltage nominal [current](#).pf rotation r.p.m 5%frame 1,5disamble removal bearing pain,

-calculation parameters for New winding

IP 87 mm, Db =128,2mm,75,5mm,package dimensionnement of iron core measure length of stator package io =87mm,

- diameter of stator package Dv=128mm inner diameter of stator package D=75,5 mm number of stator gaps z=24

-step calculation of parameters for New winding

Now measure dimension of stators slot , width of stator slot ,b1=6,621mm , b2=8,5 mm height of stator slot h = 13,267mm opening of stator slot ,no=2mm, height of slots neck a 1=0,641mm tooth width bz =3,981mm

- $Q_u = \pi / B . (b1 . b1 + b2 . b2) + h / 2 (b1 . b2) ..$

$e = Q_u = \pi . b . b / 4 + h b ..$

-calculate number of poles pair ..

$P = 60 . f / NS = 60 \times 50 / 3000 = 1 ..$ pole number ,speed 2810..

-calculate pole step $f = \pi \times D / 2 . p = 3,14 \times 75,5 / 2,1 = 118,53mm.$

-t: pole step,

-calculation pole surface .

$Q_p = T . l_p = 11853,87 = 1031211mm,, = 103,12mm$

-calculate pole surface:

Heig of lamel 1mm 0,50 to

-heigh of lamel in m 0,50 to 0,65

Type of isolation papper 0,88 to 0,90

-lacquer 0,90 to 0,92 , phosphate 0,92 0,94 no isolateur 0,99

$I_z = K_i . LP = 0,92 \times 87 = 80.04m$

-calculation of the tooth length Hz =

$H_u + a1 = B,267 + 0,691 = 13,908m,,$

hz-tooth length, Hu height of stator ,

- calculation height of the yoke stator ..

$h_j = 1 / 2 (D_v - D - 2 . h_z) ..$

$= 1 / 2 . (128 - 75,5 - 2,13,907) = 12,342mm..$

-hy :heigh of the yoke ,Dv external diameter.

-step calculation the cross section of teeth of one pole .

$Q_z = z . b_z . i_z /$

$2 . p = 24 . \times 3981 \times 80,04 / 2 \times 1 = 3823,67mm = 38,237cm ,cm$

-Qz one - tooth cross section, z number of slots,bz tooth ,width

qualuation of slots

day		

- $Q_4 = \pi/8 \cdot (b_1 \cdot b_1 + b_2 \cdot b_2) + h/2(b_1 + b_2) =$
 $\pi/8 \cdot ((6,621)(6,64) + (8,5)(8,5)) + 6,621 + 8,5 = 93,4 \text{ mm}$
 -calculation numbers of slots per pole an
 $..q = z/2.p = 24/2 \cdot 1.3 = 4$
 $..q$ - number of slots perpoles , z = number of slots-

Step calculation of pole step inslots $f = z/2.p = 24/2 \times 1 = 12$.
 Winding factor
 $..q = 1, 3, 4, 5, 6, 7, 8, 9$
 $..f = 1, ..0,99..0,960...0,95...$
 $-f = f_z + f_r....$

Day			

21. Requireded:calcuation of the induction in the teeth of the stat

- $B_z = B_{zr} \times Q_p/Q_z = 0,65 \times 103.12/38.237 = 1,753T$.
 B_z : induction in teeth of stator , b_{zr} induction in air gap.
 - calculation of the magnetic flux of one pair of poles .
 $d = B_{zr} \cdot Q_p / 1.5 \exp.7 = 0,65 \times 103 \times 13.(10)(10)(10)(10) = 0,00427 \text{ wb}$
 $..f$ = magnetic flux per pole Webber.
 -calculation of the calcuation .
 Number of turn in the phase .
 $W = 0,22 \cdot u \cdot f \cdot a / d \cdot f \cdot f = 0,22 \times 230 \times 1 / 0,0427 \times 50 \times 0,958 = 247,39..W$ - Calculation number of turn in coil ,if
 phase voltage ,
 - a number of parallel branch..
 -flux of I pole Paire ,
 Step calculation of calculation number of turn in slot, $D_u = 6 \cdot w / z = 6,247 / 24 = 61,75,,$
 S_u calculation number of turn .filing
 -Calculation of cross section of wire .
 $q'v = Q_u \cdot f_u / d_u = 93,4 \times 0,34 / 62 = 0,512 \text{ mm}$
 $q'v$ = cross section of the wire , ..
 Q_u = surface of slot.
 Step calculation of thickness of wire
 $DZ = 2 \cdot \sqrt{q'v} / \pi = 2 \cdot \sqrt{0,512} / 3,14 = 0,807..q'v$ cross section of the wire mm. +/2% range of resultat picked
 0,8 mm wire measure length connected of reassemble,motor ,400v,380v...

23.Requireded: an Expiremental in transformer rewinding Instructables.

-step : material and tools ,step2: dismantle the core step 3un rewinding the old , secondary ,, Step
 determine the wire thickness , steps 5,test winding ,step 6,
 -purpose of rewinding of Dore keep the transformer from buzzing and to seal it form environment the
 lamination hard to removes measure volt , material blowtar h ,hacsaw small sharp
 chisel,micrometre ,balance ,
 -requirement enamel,wire coil from transformer ,insulating varnish windings b,wind ratio
 $320:12 = 26,66$
 Manufacture , operation service .
 Requireded 25:

-Generator stator rewinding:record ,gas turbine steam turbine, generator,stator bar mechanical
 dynamic completed rewinding of generator ,removal stator wedge and stator ,slot wall core

event ,inspected tested using elcod ,glasky source , confirm material,

- connection ring , installed Serie bronzed induction block Serie ,
Input data unit ,

L=1000 uH requireded index

A=14,5 mm dimension .A

B=2,95 mm dimension B

C=6,7 mm

D= 1,65mm

L=4,7 mm. Slot

G=0,5mm, $\mu_r=200$ relatute .

-number of turn N=152, effective magnetic path length , $l_e=18,998$,Crosse section. $A_e=185547$ mm
sq,effective core volume , $Be =333,347$ mm cub,peak lumi by cores, $IP=0,800A$

24. Generator alternator and turbine repair and maintain m,c power generator house 14000 .mm sq .,
80ton to 100toneboverhear crane conditions power up to 373MVAto400MVA , manufacture quality
control roles ,

-Electrical power generation minor and major generator .

-design or type of generator stator or rotor general oven houl of any design .

-modification of generator including .

-rotor and stator insulator system up grade rotor and stator cooling system.

-Rotor winding modification rotor and wedge iso .

-completed rewinding of generator .

-minor and major repairs design or type.

Minor and major ,full range of testing and conditions monitoring.

Full range of testing and conditions monitoring.

-on site and off -site balancing fail finding and route cause mechanical power generation repair .

-general overhauls of any design or type of turbine .

-Diagram refurbishment pressure parts . refurbishment and replacement spare.

-reverse engineering and manufacturing of components

-Bearing refurbishment.

-faul find and root cause analyse .

-up grade and maintenances system ,

Scope of work compilation .

-comprehsive project planning quality control and documentation

completed re blading and . balancing of turbine rotor

-metallurgical investigation ., And report run up down signature testing and conditions monitoring
testing and conditions motor ,

-on site rotor repaired service.

Assessment of insulation system,

- insulation resistance,recurrent surge graph (Rsg) testing.

-high voltage testing , assessment of coik retaining volt drop testing ,on site degassing and
magnetisation.

-on site stator repair service, assessment of insulation system, polarization index high voltage testing
partial, discharge analyses core testing ,Elcid,power flux , engineering improvement investigation
cause.

Faillure design report. $VA=E \times I..$

Requireded:copper

Coil parameters calculator.

-wire diameter: 0,812mm

-number turn:1000turn

-babbin length :25,4mm

-babbin diameter :25,4

Rated DC current, turn wind ,number of winding coil diameter.

Examing generator performance caractere load watt $=v \times a..$

Measure real time,full load kW=total amp \times supply voltage 1100.resweve capacity=full load ,kW x 0,25
for percent power ,generatorize,fill ,generator size,full load reserve capacity.

Requireded:

Number of loops: , area of each mm, magnetic field Tesla,time of rotation S,EMF induce .

$\epsilon:2 \times \pi \times N \times A \times B \times f \times \cos(2\pi \times f \times t)$

ϵ :EMF inductor vole.

N: number of loops dimensionnement
 A: area of each loop in mm.
 B: magnetic field
 f: rotation frequency..
 t: time rotation.

Required:

- cross sectional area ..mm
 Total length of ..
 - resistance meter.ohm
 Resistance ...ohm
 Voltage rated Current....(v)..
 Power at rated current....,w

-

25.requirement: engineering electrical workers.departement.orientation .wastage
- .life cycle assessment:life cycle analyse is methodology associated commercial products or
services for instance case of manufacture product impact are assessed from raw material
extraction processing cradle manufacture recycling final disposal.

- Goal and scope definition yes , an inventory analyse year and impact assessment year , interpretation yes ,

- iso 14040 inventory energy and material environment aspect iso phase of use data power plan energy control pollution CO₂ dioxide , integration system model depletion assessment commissioning

- cost of installation system engineering

Cost of the cable selected and cable .total installing operating cable during.

$CT = CI + CL$, , , , CI=cost installed length cable.

CL= equivalent the date the installation was purchased , losses during life , N year, cost of materials cost product manufacturers margin to determine,

- Economic Conductor size involve, performing calculation neglect voltage dependence losses and find cross section. minimize the cost function,

$CT = CI(S) + I_o . I_o . (R(S) . F(N))$.. where as function of the conductor cross , I_o = maximum load on the cable..

- E. wnwrgy semie conductor conductor cable material magnetic, destruction wastage energy maintenance components.

. power Zener diode power rat

Calculation

, input

- V source 23v, V_{out} 32v, I_{MAX} 24ma out put Zener power rating 768 mW, resistance value -375m, resistance power rating -216m,

$I_Z r = O M / V . Z \dots 1 w / 5, 1 v ..$

- Calculate battery life ,

Input battery life input capacity rating of battery mAh,

Consumption of devices load current

Output battery life.

Capacity : measured in Amper hours , the capacity of a battery can usually be found ,

- consumption the average current draw of the electronic device .

- discharge safety the percentage that is not utilise.

Equation, battery life = capacity / consumption x (i-di)

Application : amount of time for battery can supply power to the circuit.

$Amp = 1 c / 1 s = Q / t .. I = Q / t = 900 / 3 \times 60 = 5 A,$

$Q = I \times t .. I \{ Q / t .. Q = I \times t = 3 A \times 90 s = 270 \text{ coulomb} .. p = j / c .. x C / t = j / t ..$

Dimensionnement geometry mass energy destruction.

- dure vie molecules 5ans, traitement dechet , en combien temp Se degrade in chewingom sac plastique

base matiere organique dechet degrade seulement 2semaine,1 metal rouiller integrals 100a1000 Ans
pour ,plasty polystea matiere synthetic Egypt..
Conservation energy ,,transformation energy annee Lumiere 360jours ,, destruction material 100-99
force energy destruction recyclage Vieux systeme renouvelable,breaction magnetic induit reaction
energetizer.xl..E,q,v
-Electro energie Chauffage..
propos etude conception et fabrication resistance chaffage electrothermique,
-activite: Chauffage,product et service .
Service Devi's material electroteat..

Indicator

Re: Ticket ID 35221 - Resolved and Closed - Re: sasseta, register granted sasseta company learn

Inbox



TSHINGOMBEKB
TSHITADI

Wed, May 3, 7:53 PM (3
days ago)

to PSiRA, tshingombe, tshitaditshingombe, me, tshingombekb, NBCPSS, NBCPSS, nationaloffice, reception, dtrrc.rxtension22

On Wed, 03 May 2023, 14:21 PSiRA - Digital Support Team, <digitalsupport@psira.co.za> wrote:

Dear TSHINGOMBEKB TSHITADI,

Your ticket - Re: sasseta, register granted sasseta company learn with ticket id: 35221 - has been closed.

Description of the ticket:

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

On Sat, 21 May 2022, 11:20 fiston tshingombe, <tshingombe520@gmail.com> wrote:

----- Forwarded message -----

From: **fiston tshingombe** <tshingombe520@gmail.com>

Date: Sun, May 15, 2022 at 1:42 PM

Subject: sasseta, register granted sasseta company learn

To: fiston tshingombe <tshingombe520@gmail.com>, <sassetacommunications@sasseta.org.za>, SASSETA <ibowden@sasseta.org.za>, Sasseta AGM <AGM@sasseta.org.za>, <info@seta.co.za>, <etdpseta@behonest.co.za>

Purpose: This form is for New, Extension of Scope or Re-registration as a constituent Assessor of the ETDP SETA.

Section A: Assessor Application Type		
Application Type		Evidence Required
Assessor		<ul style="list-style-type: none"> · Application form · Copy of the ID document · Copies of qualification(s) (Certificates, diploma, degree, etc.) · Curriculum Vitae
		<ul style="list-style-type: none"> · Application form · Copies of qualification(s) (Certificates, diploma, degree, etc.) · Curriculum Vitae
		<ul style="list-style-type: none"> · Application Form

Section B: Personal Information	
Title:	...tshingombe .
Full name as per ID: (First and Middle Name)	...tshingombe tshitadi.
Surname:	...tshingombe tshitadi fiston
RSA ID or Passport or Alternative Number:	... TIRGOG000910610
Statement of Results for the Generic Assessor Unit Standard (US ID No: 7978 or US ID No: 115753)	: 7978
Assessor Registration number (applicable to Extension of scope and Re-registration)123432344
Gender:	Male
Equity:	...assessment police college .
Cell No:
Email Address	...tshingombe520@gmail.com.

Section C: Scope of Qualification/s	
<i>This section to be completed only by applicants for New or Extension of scope registration</i>	
SAQA ID	Qualification Title
	Assessor moderator engineering electrical diplomat
	Assessor moderator engineering electrical diplomat pnel waring

	Assessor moderator engineering electrical diplomat panel wiring safety db boxes

Section D: Scope of Unit Standard/s

This section to be completed only by applicants for New or Extension of scope registration

SAQA ID	Unit Standard Title
	Assessor moderator engineering electrical diplomat
	Assessor moderator, assessment police
	Assessor moderator engineering electrical diplomat safety security assessment

Section E: CODE OF CONDUCT FOR ASSESSOR

If this declaration is not signed, the application will not be processed

I,	Tshingombe tshitadi fiston	hereby commit myself to abide by the ETDP SETA Code of Conduct in relation to all my work conducted as an
<p>ETDP SETA registered assessor. The Assessors' code of conduct has been drawn up to enable ETDQA registered assessors to carry out their functions objectively in line with ETDQA policies and procedures.</p> <p>The Code of Conduct to which I agree is as follows:</p> <p>1. Responsibilities:</p> <ul style="list-style-type: none"> · to plan and conduct assessments as outlined in the unit standard <i>'Plan and conduct assessment of learning outcomes'</i>; · to assess candidates against the relevant unit standard(s) and or qualification; · to be guided by the provider's assessment plan, guide, tools and reporting format; · to assess in a fair and transparent manner, avoiding bias and addressing barriers to learning; · to judge evidence observing the rules of evidence and to give constructive written feedback to candidates; moderators on unit standards and qualifications. <p>2. Declaration of Interest:</p>		

Section E: CODE OF CONDUCT FOR ASSESSOR

If this declaration is not signed, the application will not be processed

On being requested to assess a group of candidates, assessors must inform the provider in confidence:

- Whether they have (past or present) a family relationship with any of the candidates;
- Whether they might have, or be seen to have, difficulty in assessing any candidate objectively because of friendship or other obligation; and
- Any other actual or potential conflict of interest involving candidates, moderators or other relevant parties.

3. Working Practices and Quality Standards:

- Assessors must act professionally, accurately and in an unbiased manner and be responsible for their actions in the assessment process.
- Assessors must not accept any inducements, commission, gift or any other benefit (apart from fair payment), or respond to any threats or harassment from providers, their employees or any interested party, or keep silent about any colleagues who do so.
- Assessors must report any assessment irregularities, complaints or appeals and any attempts to threaten or bribe to the ETDQA in their reports.
- Assessors must not intentionally communicate false or misleading information that may compromise the integrity of any assessment. Assessors should keep relationships with candidates, moderators and providers on a professional basis.

4. Confidentiality

- Information on a provider's practices and procedure gained during the assessment process remains confidential to the provider and any information about individual learners and their organizations should remain confidential.

5. Relationship with ETDQA

- Assessors are registered with the ETDQA; this constitutes a license to practice in the sector;
- Complaints submitted by assessors to the ETDQA will be addressed by the Irregularities Committee;
- Complaints submitted about assessors to the ETDQA will be investigated, and should the assessor be in breach of the Code of Conduct, the assessor will be de-registered, and no longer able to practice as an assessor in the sector.
- Should an assessor believe that he or she has been unfairly refused registration, extension of registration, or been unfairly de-registered; the ETDQA has a proper appeals procedure which should be followed.

Signed

Tshingombetshidi

Saqan diplomat no meeting ,

TDIs are being updated and will be completed before the final submission.

KPI and KPI	SHORT DEFINITION	Purpose and importance	Source collection data	Method of calculation	Data limitation	Calculation type	Reporting cycle	New indicator	Desire performance Indicator responsible
Percentage Number of dwellings provided with connections to mains electricity supply by the municipality The number of new residential electricity connections to dwellings provided by the munic	Provides a brief explanation of what the indicator is, with enough detail to give a general understanding of the indicator	Explains what the indicator is intended to show and why it is important	Describes where the information comes from and how it is collected	Describes clearly and specifically how the indicator is calculated	Identifies any limitation with the indicator data, including factors that might be beyond the department's control	Identifies whether the reported performance is cumulative, or non-cumulative	Identifies if an indicator is reported quarterly, annually or at longer time intervals	Identifies whether the indicator is new, has significantly changed, or continues without change from the previous year.	Identifies whether actual performance that is higher or lower than targeted performance is desirable engineering responsible
measures the average	It measures the								

length of a sustained customer interruption during the measurement period	level of Repairs & Maintenance to prevent breakdowns and interruptions to service delivery								
----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------	--	--	--	--	--	--	--	--

o
SLS,
Jul, Aug, Sep, Oct, Nov., Dec
y, Jun
1
Average time taken
to
repair logged
Average time taken
to repair logged
streetlight queries
(Secondary Roads,
Main Arterials and
Area lighting)
Percentage
resolution of logged
illegal
connection
queries within 30
days
-
multiple
properties.
Percentage
resolution of logged
queries within 30
days.
Percentage
of
Domestic
meters
read as per the
download file
average time take
to

Contract government and education sector society development compagny relate low , career

MANAGEMENT AN

D

ORGANISATIONAL STRUCTURES

6.1

Organisation

Structure

The situational analysis indicates that City Power requires a fundamental culture change that will respond to the changing environment and drive the 2022 VUCA strategy. In order to succeed in its strategic mandates, City Power needs to develop the ability to improve the design, development, and implementation of initiatives and to reduce cycle time in all organisational activities.

2020/21

Engineering

Operations

Engineering Services

Metering

Services

Office of the

CEO

HR

&

Transformation

Fi

nance

Business

Sustainability

Enterprise

Support

he stakeholders of City Power have been

segmented under different governance

structures as

follows:

Governance

Structures

Detailed stakeholder

definition

Why it's important for us to

engage

Ways we engage

Re

-

sellers of

power

These categories of customer

re

-

sell our product. They

The stra

tegic intent of City Power includes

ensuring that the business performs in a

stable nurturing

environment that is conducive to the

achievement of its objectives, whilst

building an exceptional workforce

of competent and committed people who

provide leaders

hip and advocacy for our organisation.

In order to enable this, City Power has

defined five human capital strategic levers

(Capacity, Capability,

Commitment, Compliance and Continuity)

thus aligning the people strategy with the

City Power strategy and

cur

rent realities. For City Power, talent is the

number one impediment or success factor

in executing

he table below shows appointments

finalised to date in line with phase one of

the

talent acquisition

plan for FY

interact

directly

with

electricity consumers

♣

Reliable electricity supply

♣

Affordable electricity supply

♣

Working electricity meters

♣

Recognition

♣

Face to

face dialogue

Funding options

The means of funding the various portfolios of

alternative energy are still being explored, in

light of the

recently promulgated New Generation

Regulations

.

The regul

s per the

Board approved

organisation structure the City Power

Management Team is comprised of the

following:

Level

Number

of Employees

Number of Vacancies

EXCO

Chief Executive Officer

1

1

Chief Operating Officer

1
1
Executive
:
Engineering Operations
1
0
Executive
:
Strategic Assets
Deve

Delivery has failed to these recipients or groups:

RECRUITMENTSCD@citypower.co.za

The email address you entered couldn't be found. Please check the recipient's email address and try to resend the message. If the problem continues, please contact your helpdesk.

Diagnostic information for administrators:

Generating server:
CPRVNMSEMR01.citypower.co.za

RECRUITMENTSCD@citypower.co.za
Remote Server returned '550 5.1.1
RESOLVER.ADR.RecipNotFound; not found'

Original message headers:

Received: from cprvnmsemr02.citypower.co.za
(172.17.20.105) by
cprvnmsemr01.citypower.co.za
(172.17.20.104) with Microsoft SMTP Server
(TLS)
id 15.0.1497.32; Tue, 25 Apr 2023 15:08:08
+0200
Received: from post2.citypower.co.za
(172.16.0.38) by
cprvnmsemr02.citypower.co.za
(172.17.20.106) with Microsoft SMTP Server
id
15.0.1497.32 via Frontend Transport; Tue, 25
Apr 2023 15:08:08 +0200
Received-SPF: Pass (domain gmail.com
designates 209.85.219.41 as a permitted
sender),

client-ip=<209.85.219.41>;
identity=<tshingombefiston@gmail.com>;
helo=<mail-qv1-f41.google.com>;
Received: from mail-qv1-f41.google.com
([209.85.219.41]) by post2.citypower.co.za
with Trustwave SEG (v8,2,6,11305)
id <B6447d0b70000>; Tue, 25 Apr
2023 15:08:07 +0200
Received: by mail-qv1-f41.google.com with
SMTP id 6a1803df08f44-
5f16be5dccfso44953816d6.2
for
<RECRUITMENTSCD@citypower.co.za>; Tue,
25 Apr 2023 06:08:06 -0700 (PDT)
DKIM-Signature: v=1; a=rsa-sha256;
c=relaxed/relaxed;
d=gmail.com; s=20221208;
t=1682428083; x=1685020083;
h=to:subject:message-id:date:from:in-
reply-to:references:mime-version
:from:to:cc:subject:date:message-
id:reply-to;

bh=aIjrh4XGUMErJUfyiMmLLmFsIIxwD8ZHE
3bQ7ZICU3w=;

b=COwXApGtnx7B+6WXgupgzvqO8QGyfQd8
KGG9wBfkeU4skC+jq50r0NdYWbd7LyUoH

j+uZhEGAKhzt4XdBID7KxU83zx3lPtvLapUDr
4rpo+tiYLW71tldkCrDvzwtMkwWJiKz

dznI2u2DiY3Fk8hGb0tHYugeR0Q7W/yUy0C7J
gp1/Sky32N/O4LSyrC7HtiwlqTIsjen

rOwgYxAH90JcmgBqut6ifz+QzPmysNzrFMiro
2oRL65+74GXA11CktHPAzs1GM9wejhV

SYef0ZF12q4DJYlU7IqocmDyNPS3hfofbWNd
MUYQDPNoXHJOrreraHdfSDohG3gEgVOqC
ksnA==
X-Google-DKIM-Signature: v=1; a=rsa-sha256;
c=relaxed/relaxed;
d=1e100.net; s=20221208;
t=1682428083; x=1685020083;
h=to:subject:message-id:date:from:in-
reply-to:references:mime-version
:x-gm-message-
state:from:to:cc:subject:date:message-id:reply-
to;

bh=aIjrh4XGUMErJUfyiMmLLmFsIIxwD8ZHE
3bQ7ZICU3w=;

b=BwkKppf2biWAgeA/qol+uCqcbJ4Hd4ein7d
5Q+SRp19YLwn/vLFH8bZTVhjYfrcCVC

tqTyj2aJcCmI/N/xDcWC2q8YiBZRccMnn2FbF0
+BefeMWyTtmgZ4/hgsgMuzYm7cRzVA

Da8xPrnp46YfYTGb074FzVRxxl5z2bhPY+8Ak
YhLh0EDHvpF1oDfSAOJRYi5Kwlm0tOL

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MIME-Version: 1.0

References:

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In-Reply-To:

<6447c1f3.050a0220.6aa49.7297.GMR@mx.google.com>

From: tshingombe fiston

<tshingombefiston@gmail.com>

Date: Tue, 25 Apr 2023 14:08:22 +0200

Message-ID:

<CABd78RXofWau22DM56V92db+fwOYx=xySDoXyZ0Z2d_ziTdHLg@mail.gmail.com>

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To: <RECRUITMENTSCD@citypower.co.za>, <info@stpeacecollege.co.za>, <study@stpeacecollege.co.za>

Content-Type: multipart/related;
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X-SEG-SpamProfiler-Analysis: v=2.3

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X-SEG-SpamProfiler-Score: 0

Return-Path: tshingombefiston@gmail.com

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ations permit the building of new generation capacity internally from own capital funds, or additional 'Green Funding' that may be made available through the City. The regulations also permit the engagement of Independent Power Producers. City Power will be exploring all the available funding options in order to leverage from the opportunities to build new generation capacity, and improve its energy diversity and sustainability. Furthermore, the development of a standard City and National Treasury approved power purchase agreement is an option that may present the least risk to the City and provides a means to attract into the City. The work will include City Power, the EISD, the DoE and National Treasury

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Business

Plan 2021/22

The feasibility study for the implementation of a solar photovoltaic and battery energy storage system was conducted for City Power (10 facilities), JOSHCO Buildings (6 buildings) and COJ Facilities (2 facilities), based on the facility energy consumption, potential for solar production, cost of energy and lifetime cost of the system. The following observations were made: The least cost option for the different facilities resulted in 27.527MW solar photovoltaic system with a total of 7.268MWh Lithium

-

Ion storage batteries. The average Return on Investment (ROI) for all the facilities and buildings was determined to be 9.32% with an average payback period of 7 years.

8.5

Proposed allocation for Energy Storage Systems

It is

It is not unreasonable that City Power should aspire to be in a position to control at least 10% of its peak demand liability using energy storage systems, specifically to manage the winter evening peak

demand. When summated across the 39 Eskom intake points, the demand presently reaches a maximum of 2800 MW. Notified Maximum Demand penalties are being paid on several of our Eskom intake points, where the deployment of energy storage at any point on the related networks can significantly reduce the penalties paid. Energy Storage systems are able to store cheap surplus energy from any source, at a time such surplus may be available, and to release the energy again when there is a generation shortfall and peak energy pricing will apply. The stored energy will always be taken from the cheapest source available and may be either from of

f

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peak coal derived Eskom energy at night or from surplus renewable energy in the day time.

In the short term, the following Capex funded energy storage projects are planned over the next 3 years:

- Reuven System Control and Data Center, 600 kW Power Rating with 1,2 MWh capacity
 - Feeder relief demonstration sites, 4 systems, each 1MW Power Rating with 2 MWh capacity
 - Substation demonstration site, 3MW power rating, 6MWh capacity
- In addition to the City Power the owned and operated Energy Storage listed above, Energy Storage services may be purchased from Independent Energy Storage Service Provider

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CITY POWER

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Business

Plan 2021/22

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October 2020,

the Department of Minerals and Energy published New Generation Regulations aimed at enabling Municipalities to procure their own new generation capacity.

T

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se

regulations

provide municipalities that are in good financial standing with an opportunity for generation as well as energy storage

. The MFMA provides a regulatory framework that guides municipalities with regards to how to establish and manage

Public Private Partnership (PPP)

, to enable

energy procurement and trading

. City Power

is exploring the es

tablishment of

appropriately resourced

office within the Finance and Procurement

Group to drive the establishment

of the required PPPs

.

The feasibility of the new technologies has been partly examined as part of the Solar PV, Energy

Efficiency, Energy Sto

rage, Waste to Energy, Gas Options and

Electric Vehicle work streams of the

New Energy Mix Feasibility studies conducted in 2019

.

According to the 2017 EPRI report used by the IRP for the cost of energy from renewables, the

levelized cost of rooftop PV

power was R1, 07 per kWh. The IRP bases the levelized cost of fixed tilt

PV farms on the actual bids of 70 cents per kWh of Bid Window 4 of the REIPPP. This is less than the

annual average cost of Eskom's Standard period energy of 86,35 c/kWh on the Megaflex tariff.

The renewables are gradually becoming cost competitive. Furthermore, there is another key benefit in

that t

he uptake of distributed (de

- centralized) generation alternatives on the downstream side of the Eskom meter also reduces network technical losses and defers (or can completely avoid) costly infrastructure upgrades. The IRP 2019 Gazette 42784 of 18 October 2019 recognized the need to accommodate embedded generation and has the proposed allocations shown in (Table 26) below. The draft plan has an allocation of 500 MW per year up to 2030 for embedded or distributed generation, a national total of

4000 MW by 2030. The allocation applies to both privately owned as well as municipal owned generation plant. Two important Ministerial Determinations were made in 2020 with respect to the IRP. In terms of the Risk Mitigation Independent Power Procurement program (RMIP PP) allocation, the first four years of the Embedded Generation allocation of 500MW per year, the Minister determined that Eskom will be the power purchaser. In terms of the balance of the IRP, the Minister also determined that Eskom will also be the power

1. VACANCY BULLETIN: REF 001
DESIGNATION: ELECTRICIAN
(SHIFT WORKER)GROUP:
SERVICE DELIVERY CENTREDEPARTMENT:
VARIOUS SDCs
REPORTING TO:TEAM LEADER: DISTRIBUTION

TASK GRADE9 (R350 966)

Appointment Minimum Requirements:

- Electrical Trade Test CertificateAND
- N2 Electrical EngineeringAND

- Three (3) years' experience in the electrical distribution environment
- ANDValid Code C1 Driver's License
- Valid Professional Driver's Permit
- (Must be acquired within 3 months of

employment)

-3.1 Primary Purpose:

Perform daily maintenance, repair and installation of electrical systems and equipment. Perform network operating at all voltage levels to ensure a continuous availability of supply. To ensure a reliable and safe electrical system through the application of technical competencies in various tasks requiring a certified level of skills. Contribute towards maintaining a high level of customer satisfaction

Key Responsibilities:

Diagnose equipment malfunctions and repairand adjustusing the necessary test equipment , instruments and other tools of the trade. Install, modify and maintain new and existing systems and equipment by working from drawings and sketches and through verbal instructions. Optimally respond to all emergency call outs and complaints and ensure best possible response time. Inspect large electrical systems and ensure all City power requirements are met. Maintain all motors, transformers and electrical controllers attached to large power systems. Perform preventative maintenance on the electrical system i.e.switches, transformers etc. Carry out scheduled plant and equipment inspection on a regular basis to ensure a safe reliable network with minimum interruptions. Repair and install LV and MV underground and overhead networksandthe associated transformers and switchgear. Ensure the right tools and equipment is available and in good condition. Assess requirements for each specific task. Confirm the suitability of equipment for possible refurbishment or re use. Ensure customer satisfaction. Ensure compliance with all relevant legislation and SHEQ requirements

CLOSING DATE:

21 SEPTEMBER 2022

ENQUIRIES: Ext 7343

/7687/7099

TO APPLY EMAIL: recruitment.SDC@citypower.co.za

BULLETIN:

001/2022 REF NO: 001

NB: The City Power application form must be completed and submitted with the application to the relevant email address provided for the specific position. Failure to complete and submit the form will disqualify the applicant for consideration

Note: •City Power is an Employment Equity Employer; therefore, preference for this position will be given to candidates whose appointment will enhance representation (especially Gender and Disability).

•

If you do not hear from us within 2 months of the closing date, you may assume that your application was unsuccessful.

•Applicants must note that further checks will be conducted once they have been shortlisted and that their appointment will

be subject to positive outcomes on these checks, which include qualification authentication, criminal records and previous employment.

•City Power reserves the right not to fill the position or to re-advertise it. Where applicable, candidates may be expected to undergo psychometric assessments.

•

It is the applicant's responsibility to have their foreign qualifications evaluated by the South African Qualifications Authority (SAQA) and to provide the evaluation results.

•

Please include copies of your qualifications with your application

How it will benefit your career

- Join hundreds of successful graduates over the past and add this prestigious to
- Gain the knowledge and skills to take the next steps in your electrical power systems engineering career.
- Go on to develop your career at a top employer, such as electric utility providers, equipment manufacturers, specialised software houses, universities and consultancy companies

Introduction to Sustainable Electrical Energy Systems Mandatory Structure of Electrical Energy systems Basic analytical skills for electrical energy systems Components associated with electrical energy systems Analysis of Electrical Power and Energy Conversion Systems Mandatory for Faults in power systems Analysis and control of large networks Analysis and control of power electronics systems Power System Plant, Asset Management and Condition Monitoring () Mandatory for

Basic principle Design of major power system plant components Asset management and condition monitoring Substation and system design Power System Operation and Economics ()Introduction to optimisation and optimal economic system operation Electricity markets and power system economics Concepts of power system security Power system investmentSmart Grids and Sustainable Electricity Systems ()Distributed low carbon technologies Smart Grids Sustainable electricity systems Power System Dynamics and Quality of Supply ()Mandatory for:Optional fo Power system dynamics Quality of supply Reliability- Power System Protection (Introduction to protection systems Conventional protection systems Advanced protection systems - Business Cases for Sustainable Innovations (Project/team/business planning Ethics & professional responsibility Intellectual propertyReport writing (information sources, literature reviews, structure and presentation dissertation project will ideally be based on a problem you and your company need to resolve, ensuring the programme delivers value for both you and your employ

1. Visited student open days company
2. city Power aims to produce certified engineers over the next three years.
3. The provision of this on-the-job training will not only benefit students with required experience and addressing the issue of shortages of work ready skills in the country, it will also benefit them as the utility responds quicker to service disruption, improved performance efficiencies while ensuring skills transfer.
4. The utility has partnered with the Engineering Council of South Africa (ECSA) on a special joint initiative known as Road to Recruitment.
5. "There are not enough professional engineers in the country, this initiative is not just good for City Power or ECSA, and ultimately it will raise the competency levels of engineers in the country. We need other energy utilities to join the cause by providing on-the-job training.
6. The absence of professionalised engineers in the country is what drove ECSA and National Treasury to pledge allegiance with City Power to rectifying this shortfall. The programme is designed to challenge other utilities to follow suit and hire young minds to assist in elevating the sector through professionalisation.

Visited student technology support united trade working enginnnering electrical :

Day nigh shift sheddule

Risk Description Strategic Objective Rating Key Risk Treatment

1. **Compare visited implantation career city power unity trade design analyze investigation city power plant and st peace college ,system under going resulted assessment plant outcome annual report frame work st peace college academic university**
2. **ref**

The **Strong Cities Network** is designed for policymakers and practitioners operating at city, municipal or subnational level. Membership is completely free of charge. In order to sign your city up

to the Strong Cities Network you will need the approval of your Mayor. Please complete the below application form and the Strong Cities Team will be in contact to start the official registration process.

as ambitious targets and in the era of big data and connectivity, smart cities that operate reliably, responsibly and intelligently will be key to achieving these targets. Meanwhile, the so-called 'Energy (providing affordable, resilient and clean energy) has been identified as a critical issue. Innovation, and dealing with resilience and connectedness issues is among its strategic priorities. As the population continues to escalate in urban areas, more efficient use of ICT is required to cope with problems common to modern cities, such as those related to the environment, social inequality, and governance.

Education AND Educating FOR Innovation: THE POWER OF DIGITAL TECHNOLOGIES AND SKILLS

The innovation imperative in education innovation in education: why and what
Measures of innovation in education The education and skills dimension of innovation
Innovation strategies in education Key messages for innovation policies in education
Digitalization, digital practices and digital skills Digitalization .Digital skills in the adult population
Digital skills students Key messages for innovation policies in education
Digital technologies in education Integrating ICT in teaching and learning in schools
Teachers and ICT The effects of ICT on students' learning outcomes in
Key messages for innovation policies in education The potential of technology-supported learning
Introduction Examples of technology-supported pedagogical models Online resources for schools
and self-directed learning Key messages for innovation policies in education
Markets and innovation in the education industry Introduction Size and structure of the education
resource industry The innovation role of market leaders Improving the knowledge base
Implications for policy makers Key messages for innovation policies in education
Notes Business-driven innovation in education A first look at innovation in education
Patents in educational and instructional technologies Comparing innovation, reform and change
Professionals in highly innovative workplaces, by sector and innovation type Professionals in highly
innovative workplaces, by sector and country Education professionals working in highly innovative
workplaces, by education level Overall composite education innovation index, 2000-11
Critical skills for the most innovative jobs The diffusion of selected online activities among Internet
users, Internet users by age, Change in Internet access at home, Internet use among year-old
students at school and outside school Percentage of students who reported engaging in each Internet
activity
at least once a week Access to computers at home and students' socio-economic status
Common computer leisure activities outside of school, by students'
socio-economic status Problem-solving proficiency in technology-rich environments among adults
. . Problem-solving proficiency, by educational attainment

Problem-solving proficiency among younger and older adults
Labour force participation, by problem-solving proficiency using ICT percentage of workers who use
a computer at
work percentage of individuals who judge their computer skills would be sufficient
if they were to apply for

